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[Translation done.]

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**Notes:**

1. Untranslatable words are replaced with asterisks (\* \*\* \*).
2. Texts in the figures are not translated and shown as it is.

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**CLAIM + DETAILED DESCRIPTION**

[Claim(s)]

[Claim 1][ one field of a nonwoven fabric containing supereabsorbent textiles ] [ a moisture permeation impermeability film within limits whose water vapor permeability is 50 - 6,000 g/m<sup>2</sup> and 24 hours ] A sheet-shaped drier in which a moisture permeation impermeability film within the limits or water vapor permeability whose water vapor permeability is 50 - 6,000 g/m<sup>2</sup> and 24 hours piles up 50g/m<sup>2</sup> and an impermeability film of less than 24 hours on a field of another side, respectively, joins an outer periphery part to it, and is characterized by things in it.

[Claim 2]The sheet-shaped drier according to claim 1 after supereabsorbent textiles' carrying out bridge construction processing of the surface of bridge construction sodium acrylate salt system textiles and/or acrylic textiles, wherein it consists of bridge construction acrylic textiles produced by hydrolyzing.

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention relates to a sheet-shaped drier usable in the case of preservation of metal goods, such as precision instruments and electronic parts, medical supplies, and foodstuffs or packing transportation.

[0002]

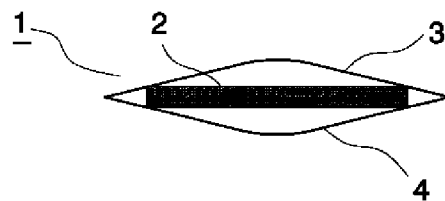
[Description of the Prior Art]Conventionally so that it may be indicated by \*\* JP,H7-323209,A, [ a sheet-shaped drier ] So that the paperboard which comprises paper pulp may be impregnated with deliquescent salts, such as a calcium chloride and chlorination magnesium, and it may be indicated by the thing which packed this paperboard with the moisture permeation impermeability film, or the \*\* utility model registration No. 3061851 gazette, What fabricated this to the sheet shaped is proposed using synthetic fiber, such as rayon.

[0003]

[Problem to be solved by the invention]However, in the Prior art, the thing of above-mentioned \*\* had the problem that deliquescence liquid will pollute a product, when deliquescence liquid leaked out from the end of a moisture permeation impermeability film or what was packed was damaged. Since the thing of above-mentioned \*\* has the low moisture absorption rate compared with the drier which consists of deliquescent salts, such as a calcium chloride and chlorination magnesium, etc., There was disadvantage that it could not be used in the case of preservation of metal goods, such as the technical field as which hygroscopic stability is required, for example, precision instruments, and electronic parts, medical supplies, and foodstuffs, or packing transportation.

Drawing selection

Drawing 1



[Translation done.]

[0004]Then, even if this invention solves the above-mentioned conventional problem and it does not use deliquescent salts, such as a calcium chloride and chlorination magnesium, have a moisture absorption rate equivalent to the drier which uses deliquescent salts, and. Let it be SUBJECT to provide the sheet-shaped drier which canceled the fault of deliquescent salts.

[0005]

[A means for SUBJECT to be solved] Without using deliquescent salts, such as a calcium chloride and chlorination magnesium, [ this invention persons ] [ ingredient / of the sheet-shaped drier which has a high moisture absorption rate equivalent to the drier which uses these deliquescent salts / moisture absorption ] [ by adopting the nonwoven fabric containing especially supereabsorbent textiles, as a result of repeating research wholeheartedly, pinching the field of a moisture permeation impermeability film and another side for the field of one of these with a moisture permeation impermeability film or an impermeability film, and joining that outer periphery part ] The practically desirable sheet-shaped drier which can solve above-mentioned SUBJECT was found out, and this invention was completed.

[0006][ namely one field of a nonwoven fabric where this invention contains supereabsorbent textiles ] [ the moisture permeation impermeability film within the limits whose water vapor permeability is 50 - 6,000 g/m<sup>2</sup> and 24 hours ] It is a sheet-shaped drier to which the moisture permeation impermeability film within the limits or water vapor permeability whose water vapor permeability is 50 - 6,000 g/m<sup>2</sup> and 24 hours piles up 50g/m<sup>2</sup> and the impermeability film of less than 24 hours on the field of another side, respectively, and joins an outer periphery part in it. Preferably, supereabsorbent textiles consist of bridge construction acrylic textiles produced by hydrolyzing, after carrying out bridge construction processing of the surface of bridge construction sodium acrylate salt system textiles and/or acrylic textiles.

[0007]

[Mode for carrying out the invention]Hereafter, the sheet-shaped drier of this invention is explained in detail based on an accompanying drawing. The section explanatory view in which each of drawing 1 and drawing 2 starts the sheet-shaped drier of this invention, and drawing 1 shows an example of a sheet-shaped drier, and drawing 2 are section explanatory views in which drawing 1 shows an example of a different sheet-shaped drier. As shown in drawing 1 and drawing 2, [ the sheet-shaped drier 1 of this invention ] After piling up the nonwoven fabric 2 containing supereabsorbent textiles, the moisture permeation impermeability film 3 arranged in the field of one of these, and the moisture permeation impermeability film 3' or the impermeability film 4 arranged in the field of another side, you may be any as long as it has joined that outer periphery part. Although this junction is usually performed by thermal melting arrival, an ultrasonic wave, a high frequency welder, etc. are mentioned as the other methods.

[0008][ as supereabsorbent textiles contained in the nonwoven fabric 2 used by this invention ] Especially if it is hygroscopic high textiles, it will not limit, but after carrying out bridge construction processing of the surface of bridge construction sodium acrylate salt system textiles and/or acrylic textiles, since hygroscopicity is high, the bridge construction acrylic textiles produced by hydrolyzing are preferred. As an example of bridge construction sodium acrylate salt system textiles, after carrying out bridge construction processing of the surface of "\*\*\* RUOASHISU [brand name by the Kanebo synthetic fiber company]", and acrylic textiles, as an example of the bridge construction acrylic textiles produced by hydrolyzing, "N-38 [the brand name by Toyobo Co., Ltd.]" etc. is mentioned. \*\* RUOASHISU has 40 weight % of moisture absorption rates, and the very outstanding moisture absorption rate under the conditions of the temperature of 20 \*\*, and 65% of relative humidity.

[0009]A general manufacturing method may be sufficient as the manufacturing method of the nonwoven fabric used by this invention. For example, the needle punch method, the water needle method, the thermal bond method, the air RAID method, etc. are mentioned. There is no pain of textiles according [ the air RAID method ] to a needle also in these, a card process is not needed, but a manufacturing process is easy, and since a manufacturing cost can be held down low, it is desirable. moreover -- the superintendent officer weight of a nonwoven fabric has 20g/m<sup>2</sup> - preferred 5,000 g/m<sup>2</sup> -- more -- desirable -- 100g/m<sup>2</sup>-3,000g/m<sup>2</sup> -- it is 200g/m<sup>2</sup>-1,000g/m<sup>2</sup> still more preferably.

[0010][ the moisture permeation impermeability film 3 and 3' which are used by this invention ] the range whose water vapor permeability is 50 - 6,000 g/m<sup>2</sup> and 24 hours -- it is necessary to be within the limits of 100 - 5,500 g/m<sup>2</sup> and 24 hours preferably, and if it is this within the limits, any moisture permeation impermeability films can be used. Although the water vapor permeability of this moisture permeation impermeability film is measured under the conditions of the temperature of 40 \*\*, and 90% of relative humidity by a cup method based on JIS Z0208, [ water vapor permeability ] When the values of water vapor permeability are 50g/m<sup>2</sup> and less than 24 hours, Since moisture absorption speed falls remarkably, when it is difficult to use it as a drier and it exceeds 6,000 g/m<sup>2</sup> and 24 hours

conversely, in order to absorb moisture rapidly, prolonged use becomes impossible and there is disadvantage of being inferior to moisture absorption stability. The thickness of a moisture permeation impermeability film can be used practically satisfactorily, if it is the range of 10-500 micrometers. When this thickness is less than 10 micrometers, since there is a possibility that the mechanical properties of a moisture permeation impermeability film may be inferior, and a film may be torn, it is not desirable. Conversely, when exceeding 500 micrometers, since the machinery aptitude at the time of packing of a moisture permeation impermeability film is inferior, it is not desirable.

[0011] Although the moisture permeation impermeability film used for this invention carries out moisture permeation of the steam, as for water or solution, the lamination film of the continuation fine porosity film of impermeability, or Japanese paper / thermoplastic resin film / thermoplastics reticulated strengthening film / thermoplastic resin film is mentioned typically. For example, on [ other than these ] a continuation fine porosity film, urethane system resin, The lamination film which applied polyamide system resin, polyvinyl alcohol system resin, etc., On a continuation fine porosity film, or a perforated polyethylene film, a perforated ethylene acetic acid vinyl system resin film, The lamination film etc. which laminated paper, cloth, a split cloth, a nonwoven fabric, etc. are mentioned to the lamination film which laminated the film which has the moisture permeability of a polyvinyl alcohol system resin film, a cellulose system resin film, etc. and also a continuation fine porosity film, or the above-mentioned lamination film. As long as the moisture permeation impermeability film illustrated above is within the limits which was adapted for the purpose of this invention, the film which performed antistatic property processing, conductive processing, and fire-resistant processing may be used for it if needed.

[0012] If the superintendent officer weight of the above-mentioned continuation fine porosity film is within the limits of 30 - 200 g/m<sup>2</sup>, any continuation fine porosity films can be used for it. As such a film, Thailand \*\* KKKU [brand name] by E. I. du Pont de Nemours & Co., SERUPOA [brand name by Sekisui Chemical Co., Ltd.], UF sheet, and Pau Lamb [Tokuyama make brand name] etc. are mentioned, for example.

[0013] The water vapor permeability of the impermeability film 4 used by this invention is 50 g/m<sup>2</sup> and 24 hour [measuring method: JIS Z 0208 (measurement conditions): [ temperature of 40 \*\* ] 90% of relative humidity, and less than cup method] -- desirable -- 20g/m<sup>2</sup>- if it is 10g/m<sup>2</sup> and a film of 24 or less hours more preferably, any films can be used for 24 or less hours. As such a film, resin films, such as olefin system resin films, such as a polyethylene system resin film or a polypropylene resin film, a polystyrene system resin film, and a polyethylene terephthalate system resin film, are mentioned, for example. The film which performed antistatic property processing, conductive processing, and fire-resistant processing may be used for an impermeability film if needed. The thickness of an impermeability film can be used practically satisfactorily, if it is within the limits of 10-500 micrometers. an impermeability film tearing and thrusting, when this thickness is less than 10 micrometers -- etc. -- since mechanical properties are inferior, it is not desirable. Conversely, when exceeding 500 micrometers, since the machinery aptitude at the time of packing of an impermeability film is inferior, it is not desirable.

[0014] In order to manufacture the sheet-shaped drier of this invention, pile up a moisture permeation impermeability film on one field of the nonwoven fabric which contains supereabsorbent textiles first, pile up a moisture permeation impermeability film or an impermeability film on the field of another side, respectively, and it ranks second, A sheet-shaped drier can be obtained by joining these outer periphery parts by thermal melting arrival etc. The thing of the shape of versatility for example, such as rectangular form, the shape of a square, the shape of a triangle, or circle shape, other than the thing of shape as shown in drawing 1 and drawing 2 can be used for the obtained sheet-shaped drier according to a use, choosing it suitably.

[0015] The sheet-shaped drier of this invention one field of the nonwoven fabric containing supereabsorbent textiles to a moisture absorption agent As mentioned above, the water vapor permeability 50 - the moisture permeation impermeability film of 6,000 g/m<sup>2</sup> and 24 hours within the limits, Moisture absorption speed can be adjusted by pinching the field of another side with the water vapor permeability 50 - the moisture permeation impermeability film of 6,000 g/m<sup>2</sup> and 24 hours within the limits, or water-vapor-permeability 50g/m<sup>2</sup> and the impermeability film of less than 24 hours, and dust can be prevented and re-use is also possible.

[0016]

[Working example] Next, although the concrete mode of this invention is explained based on an embodiment, this invention is not limited to the description of these embodiments.

[Example 1 of manufacture] So that it may become uniform on the tissue of superintendent officer weight 14 g/m<sup>2</sup> on a suction network, [ as supereabsorbent textiles ] [ "bell oasis" 10dtx and 6 mm [brand name by the Kanebo synthetic fiber company] ] It sprinkled continuously by the air RAID method, and it laminated so that superintendent officer weight might become 200 g/m<sup>2</sup>. Next, after

sprinkling water by the shape of a fog in this moisture absorption layer, the tissue of superintendent officer weight 14 g/m<sup>2</sup> was laminated on the moisture absorption layer, and it was considered as three-layer structure, and it was adjusted by through and 150 \*\*, the press roll was dried with the hot air dryer, and superintendent officer weight 228g/m<sup>2</sup> and a 1.0-mm-thick nonwoven fabric were manufactured.

[0017][Example 2 of manufacture] As supereabsorbent textiles, "N-38" 4.4dtex, 51 mm [brand name by Toyobo Co., Ltd.] and thermal melting arrival textiles and "MERUTI" (Type 4080) 4.4dtex, 51 mm [brand name by Unitika, Ltd.] was prepared at a rate of 80:20 by the weight ratio, after kneading, a card, a crossing layer, and after carrying out needle punch lightly, it processed for 2 minutes by a 150 \*\* hot wind, and superintendent officer weight 200g/m<sup>2</sup> and a 1.0-mm-thick nonwoven fabric were manufactured.

[0018][Embodiment 1] As the nonwoven fabric produced in the example 1 of manufacture is judged in square of 5 cm x 5 cm and it is shown in [drawing 1](#), this nonwoven fabric in water-vapor-permeability 150 g/m<sup>2</sup> and 24 hours. In a 170-micrometer-thick moisture permeation impermeability film [size-ized industrial company make] and 24 hours in water-vapor-permeability 4.5 g/m<sup>2</sup> and hours, after pinching with a 30-micrometer-thick biaxial drawing polypropylene film, thermal melting arrival of the outer periphery part was carried out, and the sheet-shaped drier was produced. About the obtained sheet-shaped drier, the following valuation methods estimated hygroscopicity and the result was shown in the following evaluation result and [drawing 3](#).

[0019][Valuation method] (hygroscopicity) Settle a sheet-shaped drier on the homoiothermal constant humidity machine adjusted to the temperature of 40 \*\*, and 90% of relative humidity, it was made to absorb moisture, the variation per hour of the moisture absorption rate was investigated, and the result was shown in [drawing 3](#). This moisture absorption rate was measured with the following formula.

[0020]

[Mathematical formula 1]

$$\text{吸湿率 (\%)} = \frac{(\text{吸湿後のシート状乾燥剤の重量}) - (\text{吸湿前のシート状乾燥剤の重量})}{(\text{吸湿前のシート状乾燥剤の重量})} \times 100$$

[0021][Embodiment 2] As the nonwoven fabric produced in the example 1 of manufacture is judged in square of 5 cm x 5 cm and it is shown in [drawing 1](#), this nonwoven fabric in water-vapor-permeability 5,500 g/m<sup>2</sup> and 24 hours A 120-micrometer-thick moisture permeation impermeability film [Tokuyama make], After pinching with a 30-micrometer-thick biaxial drawing polypropylene film, thermal melting arrival of the outer periphery part was carried out, and the sheet-shaped drier was produced in water-vapor-permeability 4.5 g/m<sup>2</sup> and 24 hours. About the obtained sheet-shaped drier, the same method as Embodiment 1 estimated hygroscopicity, and the result was shown in the following evaluation result and [drawing 3](#).

[0022][Embodiment 3] As the nonwoven fabric produced in the example 1 of manufacture is judged in square of 5 cm x 5 cm and it is shown in [drawing 2](#), both sides of this nonwoven fabric in water-vapor-permeability 500 g/m<sup>2</sup> and 24 hours with a 180-micrometer-thick moisture permeation impermeability film [size-ized industrial company make], After carrying out double-sided pinching, thermal melting arrival of the outer periphery part was carried out, and the sheet-shaped drier was produced. About the obtained sheet-shaped drier, the same method as Embodiment 1 estimated hygroscopicity, and the result was shown in the following evaluation result and [drawing 3](#).

[0023][Embodiment 4] The nonwoven fabric produced in the example 2 of manufacture was judged in square of 5 cm x 5 cm, and the sheet-shaped drier was produced using the same film as Embodiment 2. About the obtained sheet-shaped drier, the same method as Embodiment 1 estimated hygroscopicity, and the result was shown in the following evaluation result and [drawing 3](#).

[0024][Comparative example 1] As the nonwoven fabric produced in the example 1 of manufacture is judged in square of 5 cm x 5 cm and it is shown in [drawing 1](#), this nonwoven fabric in water-vapor-permeability 32 g/m<sup>2</sup> and 24 hours A 250-micrometer-thick moisture permeation impermeability film, After packing with a 30-micrometer-thick biaxial drawing polypropylene film, thermal melting arrival of the outer periphery part was carried out, and the sheet-shaped drier was produced in water-vapor-permeability 4.5 g/m<sup>2</sup> and 24 hours. About the obtained sheet-shaped drier, the same method as Embodiment 1 estimated hygroscopicity, and the result was shown in the following evaluation result and [drawing 3](#).

[0025][Comparative example 2] As the nonwoven fabric produced in the example 1 of manufacture is judged in square of 5 cm x 5 cm and it is shown in [drawing 1](#), this nonwoven fabric in water-vapor-permeability 6,500 g/m<sup>2</sup> and 24 hours A 100-micrometer-thick moisture permeation impermeability

film, After packing with a 30-micrometer-thick biaxial drawing polypropylene film, thermal melting arrival of the outer periphery part was carried out, and the sheet-shaped drier was produced in water-vapor-permeability 4.5 g/m<sup>2</sup> and 24 hours. About the obtained sheet-shaped drier, the same method as Embodiment 1 estimated hygroscopicity, and the result was shown in the following evaluation result and drawing 3.

[0026][Evaluation result]

(Hygroscopicity) As compared with the sheet-shaped drier of Embodiments 1-4 concerning this invention, moisture absorption speed was not able to use the sheet-shaped drier of the comparative example 1 as a drier late so that clearly from the result shown in drawing 3. The sheet-shaped drier of the comparative example 2 has too quick a moisture absorption speed, and the effect has been lost within 24 hours.

[0027]

[Effect of the Invention] Since it is possible to have a moisture absorption rate equivalent to the drier which uses deliquescent salts, such as chlorination magnesium and a calcium chloride, according to the sheet-shaped drier of this invention, it replaces with the drier which uses the above-mentioned deliquescent salts, and since it can be used, the fault of deliquescent salts is cancelable. Therefore, since the sheet-shaped drier of this invention is effective in the case of storage of electronic parts, a precision component, etc., or packing transportation and various shape, such as rectangular form, the shape of a square, the shape of a triangle, or circle shape, is processible, the industrial utility value is very high.

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[Translation done.]

Report Mistranslation

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